Substance Use among Nurses: Differences between Specialties

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ABSTRACT

Objectives. Valid data on factors that increase a health care worker's likelihood of substance use are integral in ensuring professional standards and quality health care for consumers. This study explored the association between nursing specialty and past-year substance use.

Methods. In an anonymous mailed survey, a balanced stratified sample of registered nurses (n = 4438) reported their use of marijuana, cocaine, and prescription-type drugs, as well as cigarette smoking and binge drinking.

Results. Prevalence of use of all substances was 32%. Rates varied by specialty, even when sociodemographics were controlled. Compared with nurses in women's health, pediatrics, and general practice, emergency nurses were 3.5 times as likely to use marijuana or cocaine (odds ratio [OR] = 3.5; 95% confidence interval [CI] = 1.5, 8.2); oncology and administration nurses were twice as likely to engage in binge drinking; and psychiatric nurses were most likely to smoke (OR = 2.4; 95% CI = 1.6, 3.8). No specialty differences appeared for prescription-type drug use.

Conclusions. Certain nursing specialties were more likely than others to be associated with substance use. The differences were not explained by demographic characteristics. Inasmuch as a comparison of these results for nurses with prior work on physicians found considerable agreement by specialty, preventive initiatives should consider interdisciplinary approaches to substance use education. (*Am J Public Health.* 1998;88:581–585)

Introduction

Substance use among health professionals is a problem that threatens professional standards and the delivery of quality services and, if left unchecked, can lead to grave consequences for health care consumers.[1,2] Significant numbers of professionals experience substance use problems that affect their ability to practice. Many have sought treatment, while others may continue to practice undetected.[2,3] Green proposed that 2% to 3% of all nurses are addicted to drugs,[4] while Bissell and Haberman estimated that there are 40 000 nurses with alcoholism in the United States.[1] The American Nurses Association estimated that 6% to 8% of nurses may have a drug or alcohol problem.[5] For some, substance use is the primary problem, while for others, the substance use may have begun as treatment for another condition, such as back pain or depression. Health care professionals with both kinds of problems need to be identified early, before they inflict harm on themselves or their patients. The recognition and management of chemically impaired practitioners is a high priority in both the nursing and medical professions.[5–7]

An integral component of a profession's response to this problem includes research to obtain valid data on both the prevalence of substance use and risk factors that increase likelihood of substance use. Several studies have examined nurses' substance use and have shown that overall, nurses may have no higher risk of substance use than the rest of society.[8–13] Nevertheless, within the profession there may be subgroups of nurses that are particularly vulnerable, owing to the presence of certain risk factors for substance use (exposure to death and dying, inadequate preparation for demanding aspects of the position, lack of education on alcohol and drug hazards and addictions, and burnout).[1,9,14,15] Some nurses may also believe that they are immune to the negative consequences of drug use because they are so familiar with drugs.[15,16]

Subgrouping by specialty is a natural starting point, as specialties may differ in personal selection factors, demands of the work setting, and availability of controlled substances.[17] To date, tobacco is the only substance whose use has been studied in a diverse range of nursing specialties. Studies have found high rates of smoking among psychiatric, administrative, emergency, medical, and critical care nurses[18–20] and low rates among oncology, community health,[21] and pediatric nurses.[19] Preliminary evidence suggests that there are specialty differences in the use of other substances among nurses as well. For example, in a population-based sample of Scottish nurses, female psychiatric nurses drank more heavily than medical or surgical nurses.[18] Nurses employed in critical care settings (emergency, intensive care, and operating or recovery room) reported more prescription-type substance use and easier access to substances in the workplace than non–critical care nurses.[22]

Because there have been no extensive studies of substance use among nurses, there is currently no basis on which to identify groups of nurses at risk for substance use problems. In this paper we report on the prevalence of substance use among nurses and expand on previous research by providing substance-specific

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TABLE 1—Prevalence of Past-Year Substance Use among Registered Nurses, by Specialty: Nurses Worklife and Health Study, 1994

Specialty	n	Marijuana/Cocaine Use		Prescription-Type Drug Use[a]		Cigarette Smoking[b]		Binge Drinking[c]	
		%	SE	%	SE	%	SE	%	SE
Adult critical care	486	6.2*	1.1	7.2	1.2	16.1*	1.7	22.2*	1.9
Pediatric critical care	123	6.8*	2.3	5.9	2.2	7.6	2.4	20.8*	3.7
Emergency	198	7.3*	1.9	7.8	1.9	18.0*	2.8	24.5*	3.1
Operating/PACU	406	4.6*	1.1	7.3	1.3	12.0	1.6	16.5*	1.9
Medical/surgical	723	3.0	0.6	7.9*	1.0	16.5*	1.4	14.9*	1.3
Home/community/public health	534	3.0	0.7	6.0	1.0	12.1	1.4	15.7*	1.6
Gerontology	352	1.4	0.6	4.7	1.2	18.2*	2.1	11.3	1.7
Oncology	116	3.6	1.8	8.8	2.7	15.2	2.6	25.5*	4.2
Psychiatry	235	4.4*	1.4	8.3	1.9	23.0*	2.8	14.4	2.3
Rehabilitation	92	3.4	1.9	8.8	3.0	12.6	3.6	16.9	4.0
Administration	171	2.4	1.2	5.6	1.8	15.1*	2.8	16.2	2.8
Other/nonclinical	185	4.4*	1.5	4.8	1.7	14.4	2.6	13.9	2.6
Reference category[d]	702	1.5	0.5	5.0	0.8	9.6	1.1	11.2	1.2
Total (all nurses)	4438	3.6	0.3	6.6	0.4	14.4	0.5	16.0	0.6

Note. PACU = post-anesthesia care unit.
[a]Use of amphetamines, opiates, sedatives/hypnotics, or tranquilizers "on your own."
[b]More than half a pack per day.
[c]Five or more alcoholic drinks on 1 occasion.
[d]Includes general pediatrics, general practice/school/occupational, and women's health.
*Significant ($P < .05$) difference in use between nurses in the particular specialty and those in the reference category, by chi-square test (e.g., marijuana/cocaine use: adult critical care vs reference, $\chi^2 = 18.8$, $df = 1$, $P < .01$; emergency vs reference, $\chi^2 = 15.5$, $df = 1$, $P < .01$).

use rates for a comprehensive array of nursing specialties obtained from a nationwide survey of nurses. The effects of variation in the sociodemographic composition of the specialties on rates of use are also considered.

Methods

Balanced stratified sampling was used to maximize the chance of selecting a sample representative of the US registered nurse population.[23,24] The sampling strategy combines probability sampling with model-based sampling and is described in detail elsewhere.[25] Briefly, in stratifying states, the number of registered nurses per state was used as the auxiliary variable, because of the correlation of population size with substance use. Because there was no complete listing of registered nurses in all 50 US states, 10 states were chosen with stratum moments (mean, sum of mean squared) equal to the population moments on the auxiliary variable, hence the term "balanced stratified." The assumption of balancing is that because the selected states are representative on the auxiliary variable, they should therefore be representative of the population as a whole on the dependent variable. The number of states selected per stratum was designated with optimal allocation. After duplicate names and those with out-of-state addresses were excluded, 600 nurses were selected from each state via simple random sampling for a total of 6000.

The design of the study required special consideration because of the sensitivity of some questions and the potential concern among nurses about disclosing substance use behavior.[26] An 8-page anonymous questionnaire designed for optical scanning was mailed to each subject. Data collection incorporated a modified total design method with up to 6 contacts.[27] The 1994 survey collected information on substance use, working conditions, psychological well-being, and other lifestyle and behavioral practices. The initial contact, an introductory letter, was followed by the questionnaire plus cover letter, along with a $1 incentive and a token pencil. This was followed by a reminder postcard. The next mailing contained a second questionnaire, followed by a second reminder postcard; finally, a third questionnaire was sent by certified mail. Subjects were also given postcards to return separately, to ask to be removed from the mailing list.

Past year was the selected time frame for substance use. Marijuana/cocaine use included any use of marijuana (including hashish or THC), cocaine (including crack), or both. Prescription-type drug use was defined as any use of any of the following substances taken "on your own": amphetamines, opiates, sedatives/hypnotics, or tranquilizers. Use "on your own" was defined as use without a prescription, in greater amounts or more often than prescribed, or for reasons other than those prescribed for. Binge drinking was defined as having 5 or more alcoholic drinks on the same occasion. Cigarette use was defined as smoking more than half a pack (10 cigarettes) per day. Past-year use was missing for 2% to 3% of the respondents.

To explore the association between specialty and substance use, the sample was poststratified into 15 specialties. (Specialty definitions are available on request from the authors.) Considerable recoding was needed, as almost 30% of respondents wrote in a specialty. Specialties were assigned after consulting with 2 clinical nurse experts and the manual on nursing specialties.[28] In addition, combinability was assessed by testing for homogeneity in demographic and work-descriptor variables, using analysis of variance. Sample sizes within the specialty groups were also considered so that estimates with adequate precision could be made. Fewer than 3% of respondents could not be assigned a specialty.

After prevalence was calculated, chi-square tests were used to evaluate substance use differences by specialty. Logistic regression was used to generate separate models estimating the odds of use for each of the 4 substance types. Rates were adjusted for confounding sociodemographic variables ($P < .05$: sex, urbanicity, age, marital status, education, employment, and ethnicity) because specialty substance use differences

TABLE 2—Adjusted Odds of Past-Year Substance Use among Registered Nurses, by Specialty: Nurses Worklife and Health Study, 1994

Specialty	Marijuana/Cocaine Use OR	(95% CI)	Prescription-Type Drug Use[a] OR	(95% CI)	Cigarette Smoking[b] OR	(95% CI)	Binge Drinking[c] OR	(95% CI)
Adult critical care	2.6	(1.2, 5.6)	1.4	(0.8, 2.3)	1.5	(1.0, 2.1)	1.7	(1.2, 2.4)
Pediatric critical care	3.4	(1.3, 8.9)	1.0	(0.4, 2.5)	0.7	(0.4, 1.6)	1.5	(0.9, 2.6)
Emergency	3.5	(1.5, 8.2)	1.3	(0.6, 2.5)	1.7	(1.1, 2.7)	1.9	(1.2, 3.0)
Operating/PACU	2.4	(1.1, 5.5)	1.4	(0.8, 2.5)	1.1	(0.7, 1.7)	1.6	(1.1, 2.3)
Medical/surgical	1.7	(0.8, 3.7)	1.6	(1.0, 2.6)	1.5	(1.1, 2.1)	1.2	(0.9, 1.7)
Home/community/public health	1.7	(0.8, 3.9)	1.2	(0.7, 2.0)	1.3	(0.9, 1.9)	1.5	(1.0, 2.1)
Gerontology	1.2	(0.4, 3.5)	1.0	(0.5, 1.9)	1.9	(1.3, 2.8)	1.3	(0.8, 2.0)
Oncology	1.6	(0.5, 5.2)	1.8	(0.8, 3.7)	1.3	(0.7, 2.5)	2.1	(1.2, 3.6)
Psychiatry	3.1	(1.3, 7.7)	1.7	(0.9, 3.2)	2.4	(1.6, 3.8)	1.6	(1.0, 2.5)
Rehabilitation	1.3	(0.3, 6.0)	1.7	(0.7, 4.0)	1.0	(0.4, 2.0)	1.4	(0.7, 2.8)
Administration	0.9	(0.2, 4.1)	1.3	(0.6, 2.8)	2.0	(1.2, 3.4)	2.1	(1.3, 3.6)
Other/nonclinical	3.0	(1.2, 8.0)	1.1	(0.5, 2.4)	1.6	(0.9, 2.6)	1.6	(0.9, 2.6)
Reference category[d]	1.0		1.0		1.0		1.0	

Note. The logistic regression model adjusted for sex, urbanicity, age, marital status, education, employment, and ethnicity. OR = odds ratio; CI = confidence interval; PACU = post-anesthesia care unit.
[a]Use of amphetamines, opiates, sedatives/hypnotics, or tranquilizers in a nonprescribed manner.
[b]More than half a pack per day.
[c]Five or more alcoholic drinks on 1 occasion.
[d]Includes general pediatrics, general practice/school/occupational, and women's health.

could have been due to the different demographic compositions of specialties. As others have found, these sociodemographic variables were also associated with substance use.[29] To assess the significance of the odds ratios, 95% confidence intervals were constructed around the estimates. For ease of interpretation, those specialties with the lowest use (women's health, general practice/school/occupational, and general pediatrics) were designated as the reference group. The large size of this group (n = 702) helped to stabilize the estimates.

Results

Response

Of the 5706 nurses eligible to participate, 4438 (78%) responded. The sample was predominantly female (96%) and white (94%), with a mean age of 44.3 years. The majority were married (74%); only 9% had never been married. Almost half (47%) had a bachelor's degree or higher; roughly one third (30%) lived in rural areas, and 89% were employed. Sociodemographic and work characteristics of the sample were similar to estimates obtained in a national planning survey of nurses.[30]

The most common specialty was medical/surgical (17%), followed by home/community/public health (12%) and adult critical care (11%). The sociodemographic composition of the specialties was quite varied. Oncology and critical care nurses were younger (mean age = 39 years), while those in gerontology, general practice/school/occupational, and administration were much older (mean age = 50 years). Men were overrepresented among emergency, adult critical care, operating/post-anesthesia care unit, and rehabilitation nurses (each 7% to 10% male) and underrepresented in general pediatrics and women's health (both < 1% male). Non-White nurses were underrepresented in general pediatrics and gerontology, but they constituted almost 10% of nurses in oncology and rehabilitation.

Prevalence of Use

The prevalence of past-year substance use for all substances combined was 32%. For marijuana/cocaine use it was 4%, for prescription-type drugs it was 7%, and for cigarette smoking it was 14%. Binge drinking was reported by 16% of the nurses.

As hypothesized, rates varied greatly by specialty. Oncology nurses reported the highest past-year prevalence for all substances combined (42%), followed by psychiatry (40%) and emergency and adult critical care (both 38%). Emergency and pediatric critical care nurses had the highest prevalence of marijuana/cocaine use (7%), followed by adult critical care nurses (6%) (Table 1). Prescription-type drug use was less varied across specialties: those with the highest prevalence of use were oncology, rehabilitation, and psychiatry. For cigarette smoking, psychiatry had the highest prevalence (23%), followed by emergency and gerontology (both 18%). Pediatric critical care nurses were least likely to smoke (8%). Binge drinking was high among oncology, emergency, and adult critical care nurses.

Regression Models

As shown in Table 2, the odds of marijuana/cocaine use were 3.5 times as high among emergency nurses as among nurses in the reference group, when the effects of the sociodemographic variables were removed. Five additional specialties had odds ratios between 2 and 3 for marijuana/cocaine use. The adjusted analysis did not indicate any significant association between specialty and prescription-type drug use. While the crude smoking rates of administration nurses did not stand out, the adjusted odds ratio indicated that these nurses were twice as likely as those in the reference group to smoke once sociodemographics were taken into account. Adjustment changed the results for binge drinking the most, as 3 specialties were no longer more likely to use alcohol than the reference specialty, and administration nurses became just as likely as oncology nurses to engage in binge drinking (odds ratio = 2.1).

Discussion

Overall, substance use among nurses occurred at rates comparable to rates in the general population.[29,31] Use of prescription-

type drugs was higher among nurses, while smoking and marijuana/cocaine use rates were lower.[31] Rates of binge drinking were comparable to rates found among US adults.[32] In addition, substance use rates varied greatly by specialty. These differences persisted even after sociodemographic adjustment, indicating that they were not due to variations in the demographic composition of the specialties.

Critical care and emergency nurses were more likely than others to report using marijuana or cocaine. It has been suggested that people in emergency or critical care are more likely to have a personality trait known as sensation-seeking, which embraces exposure to crisis situations.[33,34] Recreational marijuana use has been suggested in relation to sensation-seeking among physicians,[35] and aspects of this trait, including thrill-seeking and the desire for immediate gratification, have also been related to an increased likelihood of marijuana use in adolescents.[36] The sensation-seeking trait has been recently identified via genetic markers as an "impulsivity" gene.[37] However, there are also other factors related to the nature of the work in emergency and critical care settings that could increase the odds of substance use. These include the frequency of dealing with death, the unpredictable pace, the immediacy of intervention, reliance on pharmacologics, heavy work demands, and ready access to controlled substances.

In our study, oncology nurses had high overall substance use rates, which were largely due to high rates of binge drinking. Perhaps alcohol consumption serves as a coping mechanism, as a study of oncology nurses found that they had a strong need to distance themselves to limit the emotional pain they experienced while working with cancer patients.[38] The highest rates of smoking were reported among psychiatric, gerontology, and emergency nurses, a finding that replicates those of Plant et al. and Becker et al.[18,19]

Psychiatry was also a specialty with higher rates of substance use. The practice of psychiatry today is highly pharmacologically oriented. This situation may enhance the comfort of psychiatric nurses with using pharmacologics to self-medicate, or it may establish a culture in which psychotropic effects of drugs are frequently encountered and readily accepted. It could also be that acceptance of drugs in controlling psychiatric conditions makes psychiatric nurses more willing to report their own drug use or problems, compared with other specialty groups.

Noteworthy were the low substance use rates among nurses in pediatrics and women's health. This could be a result of the relatively low availability of substances in these specialties (lower dosages and frequency of use) or the selection of individuals into these specialties who are more emotionally expressive. Perhaps those who are better at expressing their feelings have less need to use substances, as they have other coping mechanisms to rely on.

One of this study's most interesting findings was the high level of agreement of the association between nurse and physician specialties and substance use. Research on substance use among physicians and physicians in training has identified some important specialty differences in substance use. After demographics were controlled, 2 specialties with high rates of substance use were emergency medicine[39] and psychiatry,[35,39–41] whereas pediatrics[39] and community medicine[40] have been reported to have low rates. Specialty similarities across the professions suggest that some of the etiologic factors associated with specialty substance use may be those the 2 professions have in common, that is, factors related to selection into the practice environment or to the nature of the work.

There are limitations inherent in this research, such as the use of retrospective self-reports and the cross-sectional design, that need to be considered in interpreting the findings. While the cross-sectional survey prevents us from examining the temporal order of the relationships, the restriction of substance use to the past year should help in this regard, as formation of a specialty affiliation likely takes longer than 1 year. Bias due to recall problems should also be mitigated by the restriction of substance use to the past year.

Methodologic studies of self-reported substance use suggest that self-report data are valid but underestimate prevalence, owing to the sensitivity of the information.[42] In our study, some nurses expressed concern that the data could be misused (e.g., they feared employment reprisals), and they may have chosen not to respond despite anonymity. In addition, nurses may have felt more comfortable reporting their use of legal substances—alcohol or cigarettes—vs marijuana, cocaine, or prescription-type drugs, which imply misuse. Nonetheless, self-report of substance use has been found to be comparable to urinalysis for obtaining estimates from community and workplace samples.[43,44]

Our data collection resulted in a 78% response rate, which, although high, does not preclude the possibility of nonresponse bias. Nonresponse bias is a concern if those who do not respond are more likely than those who do to have used substances. Use rates among those who responded later to the survey (requiring more prompting) did not differ from those for early responders for lifetime or past-year prevalence.[26] In 1 study, prevalence rates were unchanged by the inclusion of nonparticipants after a certain threshold of contacts,[45] and other studies using mailed surveys noted no responding effects.[46,47]

Most of the substance use in this study was not considered to be heavy use or to fit criteria for abuse or dependence. The data were from a community sample of nurses and will therefore be different from data collected among individuals in substance abuse treatment programs or those reported to state licensure boards. Except for alcohol and cigarette use, the definitions included use 1 or more times in the past year, and no definition required evidence of impaired performance. Nonetheless, some nurses reported levels of substance use that were indicative of problem use. Because certain specialties were associated with more than 1 substance category, we examined the possibility that this could be due to a few polydrug (multiple substance) users located in that specialty. The data did not support this possibility, as few respondents in any specialty reported substance use in more than 2 categories.

Conclusions

We found that nurses exhibited overall rates of substance use similar to those reported in other general-population surveys, although nurses had higher rates of prescription-type use. In addition, certain specialties had much higher likelihoods of substance use. Nursing specialties more likely to be associated with substance use mirrored high-use physician specialties, as did the lowest-use specialties, suggesting that there may be some common etiologic factors. We intend to examine working conditions and factors related to access to substances that could explain these findings. From such research, preventive initiatives can be designed to reduce the risk of substance use problems among nurses and other health professionals. These initiatives can focus on educating students entering high-risk specialties and on the recognition of problem users in clinical practice settings, with the goal of early identification and treatment of affected professionals in order to maximize patient safety. □

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